Editorial Introduction: Resilient Cities: Economic, Environmental and Social Perspective

International review for spatial planning and sustainable development, Vol.7 No.3 (2019), 1-3
ISSN: 2187-3666 (online)
DOI: http://dx.doi.org/10.14246/irspsd.7.3_1

Editorial Introduction

Resilient Cities: Economic, Environmental and Social Perspective

Guest Editors

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The term "resilience", and its panoply of derivations and conjugations, has known unusual popularity in recent times, often associated with sustainability. From a technical point of view, resilience is "the ability of a substance or object to spring back into shape; elasticity", as per the Oxford Dictionary. In fact, the term is widely used in engineering and physics in order to describe the property of a material or system to quickly recover from a supposed condition of stress. But the first definition from the Oxford Dictionary, and apparently the most used, mainly referred to other meanings such as "the capacity to recover quickly from difficulties; toughness". Therefore, resilience could be associated not only to physical properties, but virtually extended also to complex systems such as the economy, political institutions, ethics, welfare, health, social structures and, undoubtedly, cities and environment even beyond their physical appearance. Therefore, when the built environment is viewed as the highest and longest lasting achievement of human civilization, and the urban environment viewed as the summation of all tangible and intangible values connected with the progress of mankind, the terms "resilient" and "sustainable" sometimes come hand in hand, as if they would be interchangeable, and sometimes face discordant opposition (Garcia & Vale, 2017).

This apparent paradox originates from the science of ecology. The Canadian ecologist Holling (1973) argued that ecosystems are capable of adapting to changing environmental conditions, and he termed this property "resilience". But, since resilience explained in these terms sounds like adaptation to changing resources, its meaning has been often translated as "sustainability" and vice versa. However, when referring to urban systems and structures, a system could be resilient but not necessarily sustainable if the change of status is coped with by further exploitation of resources, or could otherwise be sustainable but not resilient if its equilibrium is founded on components prone to collapse in the absence of specific conditions. In the long history of cities, there are plenty of good examples for both cases, and the argument is still debated. Another common association couples the term with responsive capability to react in case of an emergency situation or hazard. Also, in this case, there exists a multiplicity of approaches in between "having resilience" and "being resilient". In the former, resilience is measured regarding the reaction of a system and its capability to recover as fast as

possible to return to its normal condition, concentrating on the threat or hazard the system has to mitigate; the latter considers there to be a possible strategy in order to increase the robustness of a system and, consequently, its adaptive capacity to increase or to transform its potential (Garcia & Vale, 2017). The five articles presented in this Issue examine the multifaceted aspect of resilience from different perspectives, including the management of emergency measures and risk assessment, community response to stresses induced by social and economic factors, and adaptability of urban communities, each analyzing the multiform nature of this term once associated with the urban environment.

Huang and Pai (2019) analyze the response capability of critical urban infrastructures like railway stations to respond in cases of natural hazards, technical failures, or induced threats like terrorist attacks. The strategic importance of such infrastructures, and the need to recover rapidly from interruptions or conditions of stress, make them particularly vulnerable in the case of hazards, therefore their resilience is embedded in the responsive behavior of management and staff. In their study, railway station management in Taiwan and the training of its staff towards adaptive behavior is considered as a paradigm in order to assess principles and strategies for future disaster planning and policies for urban node management.

Mardin and Shen (2019) explain the use of ArcGIS network analysis to measure evacuation distance in the case of tsunamis, a natural hazard, which implies capability of the road network to enable rapid evacuation and analysis of efficient distribution of temporary evacuation centers (TES). Their simulation of Palu, the capital city of the Central Sulawesi province in Indonesia, reveals the effectiveness of such methods in planning convenient routes and feasible distances to vertical shelters, in order also to calculate their capability and time of response given a first order of evacuation, usually only five minutes before a tsunami would hit.

Finally, the articles authored by El Amrousi et al. (2019), and by Caratelli, Misuri, and El Amrousi (2019) explore another side of urban resilience connected with social, economic, and cultural aspects of urban development. The former article analyses the capability of Dubai, UAE to deal with mutated socio-economic conditions in response to an increasing demand for highly specialized public spaces, including urban design strategies in offering a renovated cityscape, as is the case of the new Dubai Canal, with the aim to attract tourists and investors especially in relation to the expected number of visitors for the coming global event of Expo2020. The latter analyses the case of Al-Ain, UAE where the socio-cultural significance of the place and concurrent presence of heritage sites listed by UNESCO has been capable of managing massive urbanization for the last five decades, but is nowadays under consideration due to rising pressures from a challenging economy asking for further development and concerns about its sustainability, prefiguring the adaptive cultural behaviors of its community as a resilient resource capable of integrating its cultural landscape with requests for innovation.

Most of the articles contained in this Issue have been presented during the International Conference on Spatial Planning and Sustainable Development held on August 18-20, 2017 at Seoul National University, South Korea. We would like to express our sincere gratitude to researchers and reviewers who contributed their time and expertise to the journal, without their generous support it would not be possible to achieve this aimed diffusion of knowledge about sustainable development and community planning.

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